



# THE LANGLEY DATA newsletter

NASA

Solar

Energy

Data

Aids to

African

Hunger

## NASA Solar Energy Data Aids Solution to African Hunger

By DOUGLAS ISBELL, NASA HQ, and CATHERINE E. WATSON and ANNC.  
GAUDREAU, LaRC

In refugee camps in East Africa, women and children often must search for hours to find enough firewood to cook for their families. In some African cities, the urban poor spend more than half their annual income on cooking fuel.

To help solve this problem, volunteers are using data generated by NASA's Mission to Planet Earth program to help the people of East Africa learn to cook using solar energy.

"We have found the NASA Surface Solar Energy data set to be a wonderful resource, providing reliable data for any location on Earth," said Jay Campbell, a director for the non-profit Solar Cookers International (SCI), Sacramento, CA, a group that promotes the use of solar cooking technology worldwide. SCI manages solar cooking training in eight refugee camps and less developed areas, and responds to requests for information from individuals worldwide.

### New SSE Data Set Available

According to Campbell, the NASA Surface Solar Energy (SSE) data set has become invaluable to SCI in choosing sites where solar cooking will be most useful to the local population. "This quality of information is simply unavailable from other sources, and allows us to make better decisions for our consultations and project plans," he said.

In addition to being a relatively cheap heat source, solar cooking reduces smoke, air pollution and deforestation; is clean, convenient and safe around children; and also can be used to pasteurize drinking water to help prevent disease.

"Unfortunately, about 40 percent of the people in the world have no electricity," said Dr. Charles Whitlock, a senior research scientist at NASA's Langley Research Center, Hampton, VA, who led the team that developed the SSE data set. "We hope that the data can be used to improve designs of solar-assisted power systems to give electricity to some of these people."

According to Whitlock, the present SSE data also are expected to allow more efficient design of solar-assisted electricity systems for homeowners, communications stations, oil platforms and weather-monitoring instruments in remote locations of the world.

"This type of satellite data should have a very wide range of energy and agricultural applications over the long term,"

Whitlock added. "The cost of solar cells has dropped from \$100 per watt to \$2 per watt since 1970, and it's expected to drop to one-third the current price by 2010," he said.

Newly accessible via the Internet, the SSE data set is available for anyone to use. Users need only enter their latitude and longitude to receive a one-page printout on the available solar energy in their area. The global data set, a synthesis of information from several weather satellites, contains 52 monthly averages, in comparison to traditional individual measurements from isolated surface sensors.

The data set can be accessed through the NASA Langley Distributed Active Archive Center at URL:

[http://eosweb.larc.nasa.gov/DATDOCS/Surface\\_Solar\\_Energy.html](http://eosweb.larc.nasa.gov/DATDOCS/Surface_Solar_Energy.html)

The new Internet site is designed to accommodate a range of computer system capabilities. For those users with more advanced systems, text files, color and contour plots on a global scale are also available.

"The release of this data to the Internet will not only help us answer questions faster, but will allow more specific advice to be given," said SCI's Campbell. "Solar cooking provides tremendous health, environmental and financial benefits to those who can use it. Better identification of target areas will help spread this powerful tool farther and faster than before."

### 21st Century Applications

As NASA's Mission to Planet Earth progresses into the next century, Langley researchers will take advantage of all the latest data. "Working with the energy and agricultural communities, we expect to create an improved data set that accounts for smoke from biomass burning, and to add quantities that are not included in the first data set," Whitlock said.

"The additional quantities should enable new commercial applications in both the energy and agricultural industries. We also expect to use measurements from the Clouds and the Earth's Radiant Energy System instrument to create a data set that has a higher resolution," Whitlock added. This instrument is scheduled for launch in early November aboard the joint U.S.-Japanese Tropical Rainfall Measuring Mission.

The SSE data set was created by Langley and Analytical Services and Materials, Inc., Hampton, VA, under the sponsorship of NASA's Mission to Planet Earth enterprise. This office leads a long-term, internationally coordinated research effort to study the Earth as a global environmental system.

NASA Press Release #97-108, May 22, 1997

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New  
Partnership  
With  
NARSTO

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Increased  
Emphasis on  
Web-based  
Data Search  
and  
Access

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## New Partnership with NARSTO

BY JOHN OLSON

The North American Research Strategy for Tropospheric Ozone (NARSTO) is a public/private partnership, whose membership spans government, the utilities, industry, and academia throughout Mexico, the United States, and Canada. Its primary mission is to coordinate and enhance policy-relevant scientific research and assessment of tropospheric ozone behavior, with the central programmatic goal of determining workable, efficient, and effective strategies for local and regional ozone management.

In accomplishing this goal, NARSTO is charged with establishing and maintaining effective communication channels between its scientific effort and its client community of planners, decision-makers, stakeholders, and nongovernmental organizations, which determines the most effective strategies for scientific investigation.

NARSTO coordinates the allocation of financial resources to implement these strategies, and monitors progress of its effort toward fulfillment of its programmatic goal.

In 1996, the Langley DAAC was established as the official NARSTO archive. This action is part of NASA's in-kind support of NARSTO. In early 1997, the Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC) in Oak Ridge, TN, was established as the NARSTO Quality Systems Science Center (QSSC). The Langley DAAC will work with the QSSC to ensure the data provided for archival meets the established requirements for data format, metadata information, documentation and sample read software. The QSSC will process field campaign data to ensure conformity to the Langley DAAC standards. However, model data will be sent directly to the Langley DAAC for archival. Therefore, the DAAC will assist the QSSC in the preparations of Quality Integrated Work Plans to ensure investigators understand Langley DAAC archival requirements.

It is estimated that 15-20 past field experiments are candidates for archival at the Langley DAAC in addition to the future campaigns. In April 1997, the QSSC started receiving data from the NARSTO-North East and NARSTO-Canada East field experiments. The QSSC is using that data to establish internal quality assurance and quality control procedures. The data will also be used to establish the QSSC/Langley DAAC archival protocols.

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## Increased emphasis on Web-based data search and access

The Langley DAAC is placing increased emphasis on providing convenient customer access to data through Web access. This effort is prompted by guidance from our User Working Group, suggestions from a variety of customers, and the growing general usage of the Web. The first step has been to enhance the "Data Accessible from the Web" portion of the DAAC Web site to increase the amount of data that can be directly downloaded. At present, data from seven projects are provided including all of the Global Tropospheric Experiment (GTE) data, a Surface Solar Energy (SSE) data set, and the ACRIM II Total Solar Irradiance data. This type of data access is particularly suited to small data sets in easily readable formats and offers a simple approach for customers who know the data sets they want.

The second and more general approach involves formation of a DAAC Web team to create an HTML-driven data search and access interface similar to the search engines commonly used on the Web. This project is using a cycle of prototyping and customer feedback that will provide rapid addition of new capabilities, allow DAAC customers the opportunity to provide feedback during development, and ultimately provide an additional means of searching for and ordering data from the DAAC. The approach

uses key word search paradigms like those on popular Web search engines, such as Yahoo and Alta Vista, and features similar to the Web search environment at the Oak Ridge DAAC's BIOME web site.

The initial prototype currently available allows a user to enter key words on an HTML form to search data sets, sensors, and parameters in the DAAC database; narrow the parameters which are sensitive in context to the keywords; and view a list of data granules which result from the search.

New capabilities are being added with initial emphasis that allows search and browse capabilities without requiring user registration and offering a quick entry field for users who have previously registered. Additional capabilities will include download of data granules via HTTP or FTP, spatial search, ordering of data on media, display of browse image thumbnails with applicable granules, and download of documentation and read software from the search result data list.

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We've moved!  
Check out our new Internet site:

<http://eosweb.larc.nasa.gov>

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# School Kids

## Keep their

### Heads in

#### Clouds

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# Climate effects

## of Contrails

### at AGU

#### Meeting

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## S'COOL Project to go international:

### School kids keep their heads in clouds

BY CATHERINE E. WATSON

During the school day, most teachers prefer that their students keep their heads in the classroom. At two local elementary schools [in Virginia], however, teachers are encouraging their students to keep their heads in the clouds.

Fourth-graders at Poquoson Elementary School and sixth-graders at Peasley Middle School in Gloucester are learning to observe clouds as part of a NASA Langley global cloud measuring project—the Students' Cloud Observations On-Line (S'COOL) project. The S'COOL project provides ground-based cloud measurements in support of a Langley-developed satellite experiment to be launched in November.

The students' initial cloud observations are being compared to data taken from a weather satellite orbiting the Earth. Later this year, after the students have perfected their cloud observing techniques, they will make cloud observations that Langley researchers can compare to their new satellite experiment, the Clouds and the Earth's Radiant Energy System (CERES) instrument.

Researchers from the Radiation Sciences Branch taught the students how to determine the types of clouds above their school, the clouds' altitudes and how much of the sky is covered by clouds at the time of their observation. Working in teams, the students form a consensus of their observations. Then, via the Internet, the students place their data in the Langley Distributed Active Archive Center (DAAC), where the data is stored for further analysis . . .

"It's a great opportunity for students to get involved in a real scientific project with real scientists," said David Young, a researcher in the Radiation Sciences Branch and a mentor to the students.

CERES will be a follow-on to Langley's highly successful Earth Radiation Budget Experiment that was launched in 1984. CERES will provide long-term global data on the Earth's clouds and energy budget, and will be launched in November aboard the Tropical Rainfall Measuring Mission satellite as part of NASA's Mission to Planet Earth program.

"Clouds are important because they help modulate the climate," said Young. "We're looking for signals from possible global warming, and it's been shown that clouds are a very important aspect [of global warming]."

"One of the hardest jobs for CERES is the determination of clear-sky; that's the easiest part of the observation for the kids," said Lin Chambers, a researcher in the Radiation Sciences Branch. "S'COOL observations will allow us to improve the CERES clear-sky algorithms and will help the kids understand how clouds connect to climate."

"At the time we're make cloud observations with CERES, we're going to have students across the country making observations of cloud amount and cloud height that we can use to help validate our measurements," said Young.

"So far, I have schools in Pennsylvania, South Dakota, Georgia, Arizona, New York and, of course, Virginia," said Chambers. The Langley researchers also plan to enlist students worldwide to observe clouds for the S'COOL project. "I'm already working with contacts in Chile, South Africa, Korea, Australia and the Philippines for later global tests," Chambers added. "The importance of global coverage is that we need to compare to satellite results in as many different places as possible."

—Reprinted from The Researcher News,  
NASA Langley Research Center, June 6, 1997

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## Climatic effects of Contrails discussed at AGU meeting

"For 30 years people have been speculating about whether contrails might be affecting the climate," said O. Brian Toon, a physicist at the University of Colorado, Boulder. Toon and his colleagues in NASA's "Subsonic Aircraft: Contrail and Cloud Effects Special Study," or SUCCESS, reported their initial findings at the spring meeting of the American Geophysical Union.

"Because of increasing air traffic, contrails have become a ubiquitous feature of American skies," writes Dr. Patrick Minnis, an atmospheric scientist for the Radiation Sciences Branch at NASA LaRC. "In addition to understanding their formation processes and composition through in situ and high-resolution remote sensing," Minnis continues, "it is important to determine large-scale contrail effects to assess their impact on climate. Satellite remote sensing is the best means of studying changes in large-scale cloudiness due to contrails."

The SUCCESS program was a field mission carried out in April and May of 1996 to better understand the effects of subsonic aircraft exhaust on contrails, cirrus clouds, and atmospheric chemistry. The NASA DC-8, ER-2, and T-39 aircraft, along with coincident ground measurements, were used to sample aircraft exhaust, clouds, and contrails as a surrogate for satellite remote sensing. A wide variety of sampling measurements of gaseous species and aerosols in conjunction with radiometric measurements has been accumulated which represents a uniquely comprehensive database for contrail and cirrus properties in the upper troposphere.

SUCCESS is cosponsored by NASA's Subsonic Assessment Program and the Radiation Sciences Program which are part of the overall Aeronautics Program and the Mission to Planet Earth Program, respectively.

SUCCESS has well over a hundred direct participants from several NASA Centers, other agencies, universities, and private research companies. Data sets are available from the Langley DAAC by contacting the User's Services office by email at [userserv@eosdis.larc.nasa.gov](mailto:userserv@eosdis.larc.nasa.gov)

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## SAGE II CD-ROM now available at the Langley DAAC

The Langley DAAC staff assisted researchers from the NASA Goddard Institute for Space Studies (GISS) in the production of the "Stratospheric Aerosol and Gas Experiment II (SAGE II) Color Contour Maps of Monthly Mean Aerosols, Ozone, Water Vapor, and Nitrogen Dioxide" CD-ROM. The CD-ROM is ISO9660 compliant allowing PCs, Macintoshes and Unix machines access to it.

The CD-ROM contains SAGE II monthly mean global color image maps and the relevant gridded data for aerosol extinction at four wavelengths; ozone mixing ratio; water vapor mixing ratio and relative humidity; and nitrogen dioxide mixing ratio. The data are reported for 14 pressure levels. By providing the SAGE II monthly

mean color maps and gridded data, the SAGE II data will be easily accessible to a larger community. The visual maps provide for a quick scan of the monthly retrievals, while the gridded data should be helpful for analysis and can be used as input for other graphical presentations and statistics.

This CD-ROM may be ordered from the Langley DAAC home page by following the "Access Data" link to the Order Form for CD-ROMs and Videocassettes. More information may be obtained from the Langley DAAC Science, User and Data Support Office at [userserv@eosdis.larc.nasa.gov](mailto:userserv@eosdis.larc.nasa.gov).

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## Our User Support Staff

The Langley DAAC Science, User, and Data Support Office (SUDS) is the first point of contact for users who have questions about the DAAC. Over 100 customers a month contact SUDS with questions about EOSDIS data, documentation, software, data formats, and other services. Not only do SUDS staff members help customers, but since they are schooled in various fields of Earth Science, such as Atmospheric Science and Environmental Chemistry, they work closely with data providers to archive their data products and make them available to users. Moreover, SUDS staff members work to educate the general public about EOSDIS and Earth Science.

## The Langley DAAC Home Page

The Langley DAAC has developed a graphical user interface which allows users to search the DAAC's data inventory, view browse images, choose desired data sets, and place orders. This system, as well as a character-based system, are accessible via our homepage:

<http://eosweb.larc.nasa.gov>

This Web Page also allows users to order CD-ROMs and videocassettes, download and place media orders for select data sets, and search for documentation. Users can also get access to data at other data centers via the Earth Observing System Data and Information System (EOSDIS) World Wide Web Gateway.

## Upcoming Events

NASA Langley Open House,  
NASA Langley Research Center  
July 19

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DAAC User Working Group Meeting,  
NASA Langley Research Center  
Sep 11-12

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CERES Science Team Meeting,  
Corvallis, OR  
Sep 16-18

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TRMM Launch  
Tanegashima Space Center, Japan  
October 31, 1997

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Bulk Rate  
Postage Fees Paid  
NASA  
Permit No. G-27



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